



[6450-01-P]

DEPARTMENT OF ENERGY

[Case Number 2019-006; EERE-2019-BT-WAV-0020]

Energy Conservation Program: Decision and Order Granting a Waiver to Bradford White Corporation from the Department of Energy Consumer Water Heaters Test Procedure

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of Decision and Order.

SUMMARY: The U.S. Department of Energy (DOE) gives notice of a Decision and Order (Case Number 2019-006) that grants to Bradford White Corporation (BWC) a waiver from specified portions of the DOE test procedure for determining the energy efficiency of the specified basic model of consumer water heaters. Under the Decision and Order, BWC is required to test and rate the specified basic model of its consumer water heaters in accordance with the alternate test procedure specified in this Decision and Order.

DATES: The Decision and Order is effective on [INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]. The Decision and Order will terminate upon the compliance date of any future amendment to the test procedure for consumer water heaters located at 10 CFR part 430, subpart B, appendix E that addresses the issues presented in this waiver. At such time, BWC

must use the relevant test procedure for this product for any testing to demonstrate compliance with the applicable standards, and any other representations of energy use.

FOR FURTHER INFORMATION CONTACT: Ms. Lucy deButts, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 287-1604. E-mail: *AS_Waiver_Requests@ee.doe.gov*.

Mr. Eric Stas, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-33, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 586-5827. E-mail: *Eric.Stas@hq.doe.gov*.

SUPPLEMENTARY INFORMATION:

In accordance with Title 10 of the Code of Federal Regulations (10 CFR 430.27(f)(2)), DOE gives notice of the issuance of its Decision and Order as set forth below. The Decision and Order grants BWC a waiver from the applicable test procedure at 10 CFR part 430, subpart B, appendix E for a specified basic model of consumer water heaters, and provides that BWC must test and rate such products using the alternate test procedure specified in the Decision and Order. BWC's representations concerning the energy efficiency of the specified basic model must be based on testing according to the provisions and restrictions in the alternate test procedure set forth in the Decision and Order, and the representations must fairly disclose the test results. Distributors, retailers, and private labelers are held to the same requirements when making representations regarding the energy efficiency of these products. (42 U.S.C. 6293(c))

Consistent with 10 CFR 430.27(j), not later than [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*], any manufacturer currently distributing in commerce in the United States products employing a technology or characteristic that results in the same need for a waiver from the applicable test procedure must submit a petition for waiver. Manufacturers not currently distributing such products in commerce in the United States must petition for and be granted a waiver prior to the distribution in commerce of such products in the United States. 10 CFR 430.27(j). Manufacturers may also submit a request for interim waiver pursuant to the requirements of 10 CFR 430.27.

Signed in Washington, DC, on January 16, 2020.

Alexander N. Fitzsimmons,
*Acting Deputy Assistant Secretary for Energy Efficiency,
Energy Efficiency and Renewable Energy.*

Case # 2019-006
Decision and Order

I. Background and Authority

The Energy Policy and Conservation Act, as amended (EPCA),¹ authorizes the U.S. Department of Energy (DOE) to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part B² of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency for certain types of consumer products. These products include consumer water heaters, the focus of this document. (42 U.S.C. 6292(a)(4))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6291), test procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), energy conservation standards (42 U.S.C. 6295), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

¹ All references to EPCA in this document refer to the statute as amended through America's Water Infrastructure Act of 2018, Public Law 115-270 (Oct. 23, 2018).

² For editorial reasons, upon codification in the U.S. Code, Part B was redesignated as Part A.

The Federal testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6295(s)), and (2) making representations about the efficiency of those products (42 U.S.C. 6293(c)). Similarly, DOE must use these test procedures to determine whether the product complies with relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE is required to follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect energy efficiency, energy use, or estimated annual operating cost of a covered product during a representative average use cycle or period of use and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for consumer water heaters is contained in the Code of Federal Regulations (CFR) at 10 CFR part 430, subpart B, appendix E: *Uniform Test Method for Measuring the Energy Consumption of Water Heaters* (appendix E).

Any interested person may submit a petition for waiver from DOE's test procedure requirements. 10 CFR 430.27(a)(1). DOE will grant a waiver from the test procedure requirements if DOE determines either that the basic model for which the waiver was requested contains a design characteristic that prevents testing of the basic model according to the prescribed test procedures, or that the prescribed test procedures evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide

materially inaccurate comparative data. 10 CFR 430.27(f)(2). DOE may grant the waiver subject to conditions, including adherence to alternate test procedures. *Id.*

II. BWC's Petition for Waiver: Assertions and Determinations

By letter dated July 3, 2019, BWC filed a petition for waiver and a petition for interim waiver from the test procedure for consumer water heaters set forth at appendix E.³ The test procedure for water heaters includes a 24-hour Simulated Use Test (SUT) which consists of a series of hot water draws and standby periods during which the energy consumption of the water heater is measured. For storage-type water heaters, as the stored hot water loses heat through hot water draws and standby losses, the heat source (*e.g.*, the burner, heat pump, electric heating element) will turn on or “cut-in” to heat water within the tank as needed to maintain the setpoint temperature of the thermostat. Once the thermostat is satisfied, the heat source will turn off or “cut-out.” The time during which the heat source is on is referred to as a “recovery period” because the water heater is recovering the heat lost from the stored water. The first recovery period of the 24-hour SUT is used to determine the “recovery efficiency” of the water heater, which impacts the overall measure of efficiency (*i.e.*, the uniform energy factor (UEF)). BWC stated that for gas and heat pump storage-type consumer water heaters for which the first cut-out of the 24-hour SUT occurs in the middle of one of the draws, the use of average water temperatures in the DOE test procedure calculation for recovery efficiency artificially inflates the determined energy delivered from the system. BWC asserted that this yields an artificially

³ The specific basic model for which the petition applies is the consumer water heater basic model RG2PV50S*N. Although BWC initially included 50 consumer water heater basic models in its July 3, 2019 petition for waiver, BWC later limited the request to include only the RG2PV50S*N basic model via email correspondence on July 30, 2019. This email correspondence is included in the docket at: <https://www.regulations.gov/docket?D=EERE-2019-BT-WAV-0020>.

higher recovery efficiency and results in a lower overall UEF. In support of its waiver request, BWC submitted test data for an individual model based on the platform of the basic model for which BWC seeks a waiver.

On October 8, 2019, DOE published a notice that announced its receipt of the petition for waiver and granted BWC an interim waiver. 84 FR 53710 (Notice of Petition for Waiver). In the Notice of Petition for Waiver, DOE reviewed BWC's description of the issue and suggested alternative test method, as well as test data submitted by BWC. DOE initially agreed with the petitioner's claim that the test procedure at appendix E would test the model in a manner that is unrepresentative of its energy use. DOE also agreed generally that the suggested alternative test method would result in a more accurate calculation of recovery efficiency in those instances in which the first cut-out occurs during a draw, and avoids artificial inflating of the recovery efficiency (thereby resulting in a lower UEF value) that occurs using the calculation in DOE's current test procedure. Because BWC's petition for waiver stated that the issue may not occur for every individual model within a basic model designation, in the interim waiver that DOE granted, DOE modified the suggested alternate test procedure to specify that the alternate calculation applies only if the first cut-out of the 24-hour SUT occurs during a hot water draw during testing. Specifically, the interim waiver required the basic model to be tested to appendix E, except that in the event of such occurrence, the interim waiver provided alternative provisions for section 6.3.2 of appendix E. 84 FR 53710, 53712-53713 (Oct. 8, 2019). The alternative provisions to section 6.3.2 added a new section 6.3.2.2 which included an equation for recovery efficiency to be used if the first cut-out occurs during a draw. The equation in section 6.3.2.2

used a summation of the energy removed from the tank via hot water for each individual draw, rather than average values across the draws. *Id.*

In the Notice of Petition for Waiver, DOE also solicited comments from interested parties on all aspects of the petition and the specified alternate test procedure. *Id.* at 84 FR 53713-53714. DOE received two substantive comments in response to the Notice of Petition for Waiver, one from Rheem Manufacturing Company (Rheem), and the other from Jim Lutz (Lutz).⁴

Rheem acknowledged the issue identified by BWC and supported the use of the equation provided in the alternate test procedure, stating that it provides for a more accurate measurement of efficiency and determination of UEF. (Rheem, No. 3 at p. 1) Rheem also stated that this issue is not unique to the model specified by BWC, and that the problem is related to the measurement conditions in appendix E, rather than the result of specific design attributes. (*Id.*) Rheem stated that a broad range of characteristics contribute to cut-in and cut-out timing and recovery duration, such as input rate, efficiency, heater geometry, and temperature control and response. (Rheem, No. 3, pp. 1-2) Rheem stated that, based on its analysis, a typical gas storage or heat pump storage water heater could terminate recovery after several draws. (*Id.*) Therefore, Rheem recommended that the waiver not be approved but instead that DOE act to amend the test procedure to correct and improve the issues related to the model in the waiver and the other model types identified by Rheem. (Rheem, No. 3, p. 2) Although Rheem acknowledged that

⁴ Rheem's and Lutz's comments can be accessed at: <https://www.regulations.gov/docket?D=EERE-2019-BT-WAV-0020>. A third, non-substantive comment was received from an anonymous submitter.

other manufacturers experiencing the same issue can also request a waiver, it stated that such process is not expedient nor practical to do so on a model by model basis; accordingly, the commenter reasoned that, unless the test procedure is amended, granting the waiver would create a competitive disadvantage for other manufacturers facing the same issue. (*Id.*)

As discussed in the Notice of Petition for Waiver and in this document, the issue identified by BWC occurs when, due to a design characteristic (or characteristics), a consumer water heater cuts-out during a draw. 84 FR 53710, 53711 (Oct. 8, 2019). As such, the basic model specified by BWC in its petition contains one or more design characteristics which cause the prescribed test procedures to evaluate the basic model in a manner so unrepresentative of its true energy and/or water consumption characteristics as to provide materially inaccurate comparative data. *See* 10 CFR 430.27(a)(1). Where the relevant showing has been made under 10 CFR 430.27, a petitioner, such as BWC, is entitled to waiver relief from the applicable DOE test procedure.

While other consumer water heater basic models may encounter similar issues to those experienced by the model identified by BWC, DOE does not have information indicating that consumer water heaters typically experience a cut-out in the middle of a hot water draw. Rather, because hot water is usually removed from the tank at a rate faster than the heater can recover, the heat source (*e.g.*, burner) typically stays on for the duration of the draw and until after the hot water draw has terminated to achieve the required setpoint.⁵

⁵ DOE reviewed test data for 32 UEF tests and found that just 1 model experienced cut-out during a hot water draw.

Regarding Rheem's concern about the impacts of granting the subject waiver on similarly situated manufacturers, DOE notes that its regulations already address such concerns. More specifically, the DOE regulations at 10 CFR 430.27(j) provide that within 60 days after the date of this waiver, any manufacturer currently distributing in commerce in the United States a product employing a technology or characteristic that results in the same need for a waiver is to submit a petition for waiver pursuant to the requirements of 10 CFR 430.27. Manufacturers not currently distributing such products in commerce in the United States must petition for and be granted a waiver prior to distribution in commerce in the United States. 10 CFR 430.27(j). Manufacturers may also submit a request for interim waiver. *Id.* Further, the regulations provide that as soon as practicable after the granting of any waiver, DOE will publish in the *Federal Register* a notice of proposed rulemaking to amend its regulations so as to eliminate any need for the continuation of such waiver, and as soon thereafter as practicable, DOE will publish in the *Federal Register* a final rule. 10 CFR 430.27(l).

Lutz suggested a wording change to the definition of the first recovery period in the definition of the variable " N_r " in the alternate test procedure. In the interim waiver, DOE defined " N_r " as follows:

N_r = number of draws occurring during the first recovery period. The first recovery period is defined by the time when the main burner of a storage water heater is lit ("cut-in") and continues during the temperature rise of the stored water until the main burner cuts-off ("cut-out"); if the cut-out occurs during a subsequent draw, the first recovery period includes the time until the draw of water from the tank stops. If, after the first cut-

out occurs but during a subsequent draw, a subsequent cut-in occurs prior to the draw completion, the first recovery period includes the time until the subsequent cut-out occurs, prior to another draw.

Lutz recommended that, rather than define the first recovery period as starting when the main burner is lit (“cut-in”), it should be defined as starting at the beginning of the test. Lutz stated that this change would capture any energy in water removed in draws before the cut-in if it does not occur in the first draw, which should be included in the calculation of recovery efficiency. (Lutz, No. 2 at p. 1)

DOE notes that “recovery efficiency” is defined in section 1.10 of appendix E as “the ratio of energy delivered to the water to the energy content of the fuel consumed by the water heater.” Since the initial recovery would replace heat removed from the water heater during draws prior to that first recovery (when applicable), DOE agrees it is appropriate to capture the energy delivered during the first draw. Further, section 1.13 of appendix E defines Q_r , which is used in the calculation of recovery efficiency, as the energy consumption of the water heater from the beginning of the test to the end of the first recovery period following the first draw, which may extend beyond subsequent draws. Therefore, the DOE test procedure already accounts for the energy consumed from the start of the test to the end of the first recovery period, so DOE is adopting this slight change, as suggested by Lutz.

Lutz also recommended that the alternate test procedure, including the new wording change, be applicable to all storage type water heaters. (Lutz, No. 2 p. 1) In response, the

waiver process is to address a particular basic model(s) that contains one or more design characteristics which either prevent testing according to the prescribed procedures, or cause the prescribed test procedures to evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(a)(1). Each petition must identify the particular basic model(s) for which a waiver is requested. 10 CFR 430.27(b)(1)(i). DOE only evaluates and grants, as appropriate, a waiver for the basic model for which the waiver was requested. *See* 10 CFR 430.27(f)(2). A petitioner may request that DOE extend the scope of a waiver to include additional basic models employing the same technology as the basic model(s) set forth in the original petition. 10 CFR 430.27(g). As such, the regulations do not provide for issuing a broad waiver in the manner suggested by Lutz. As stated, DOE will address this issue more broadly in an update to the test procedure.

For the reasons explained here and in the Notice of Petition for Waiver, absent a waiver, the basic model identified by BWC in its petition cannot be tested and rated for energy consumption on a basis representative of its true energy consumption characteristics. DOE has reviewed the recommended alternate procedure suggested by BWC and concludes that it will allow for the accurate measurement of the energy use of the specified basic model, while alleviating the testing problems associated with BWC's implementation of DOE's applicable consumer water heaters test procedure for the specified basic model. As explained in the Notice of Interim Waiver, DOE modified the suggested alternate test procedure to specify that the alternate calculation applies only if the first cut-out of the 24-hour SUT occurs during a hot water draw during testing. In addition, as discussed, DOE is further modifying the alternate test

procedure specified in the interim waiver as recommended by Lutz to define the first recovery period as beginning at the start of the test rather than at cut-in.

Thus, DOE is requiring that BWC test and rate the specified consumer water heaters basic model for which it has requested a waiver according to the alternate test procedure specified in this Decision and Order.

This Decision and Order is applicable only to the basic model listed and does not extend to any other basic models. DOE evaluates and grants waivers for only those basic models specifically set out in the petition, not future models that may be manufactured by the petitioner. BWC may request that DOE extend the scope of this waiver to include additional basic models that employ the same technology as those listed in this waiver. 10 CFR 430.27(g). BWC may also submit another petition for waiver from the test procedure for additional basic models that employ a different technology and meet the criteria for test procedure waivers. 10 CFR 430.27(a)(1).

DOE notes that it may modify or rescind the waiver at any time upon DOE's determination that the factual basis underlying the petition for waiver is incorrect, or upon a determination that the results from the alternate test procedure are unrepresentative of the basic models' true energy consumption characteristics. 10 CFR 430.27(k)(1). Likewise, BWC may request that DOE rescind or modify the waiver if the company discovers an error in the information provided to DOE as part of its petition, determines that the waiver is no longer needed, or for other appropriate reasons. 10 CFR 430.27(k)(2).

As explained above, the test procedure specified in this Decision and Order is not exactly the same as the alternate test procedure offered by BWC. If BWC believes that the alternate test method it suggested provides representative results and is less burdensome than the test method required by this Decision and Order, BWC may submit a request for modification under 10 CFR 430.27(k)(2) that addresses the concerns that DOE has identified with that procedure. BWC may also submit another less burdensome alternative test procedure not expressly considered in this notice under that same provision of DOE's regulations.

III. Consultations with Other Agencies

In accordance with 10 CFR 430.27(f)(2), DOE consulted with the Federal Trade Commission (FTC) staff concerning the BWC petition for waiver.

IV. Order

After careful consideration of all the material that was submitted by BWC and comment received in this matter, it is **ORDERED** that:

(1) BWC must, as of the date of publication of this Order in the *Federal Register*, test and rate the following "BRADFORD WHITE" and "JETGLAS" branded consumer water heaters basic model with the alternate test procedure as set forth in paragraph (2):

Brand	Basic Model
BRADFORD WHITE, JETGLAS	RG2PV50S*N

(2) The alternate test procedure for the BWC basic model referenced in paragraph (1) of this Order is the test procedure for consumer water heaters prescribed by DOE at 10 CFR part 430, subpart B, appendix E, except for Section 6.3.2 (which is modified as detailed below). All other requirements of appendix E and DOE's regulations remain applicable.

The changes to section 6.3.2 of Appendix E read as follows:

6.3.2 Recovery Efficiency.

6.3.2.1 Except as provided in section 6.3.2.2 of this Appendix, the recovery efficiency for gas storage-type water heaters, η_r , is computed as:

$$\eta_r = \left(\frac{M_1 * C_{p1} * (\bar{T}_{del,1} - \bar{T}_{in,1})}{Q_r} + \frac{V_{st} * \rho_2 * C_{p2} (\bar{T}_{max,1} - \bar{T}_0)}{Q_r} \right)$$

Where:

M_1 = total mass removed from the start of the 24-hour simulated-use test to the end of the first recovery period, lb (kg), or, if the volume of water is being measured,

$$M_1 = V_1 \rho_1$$

Where:

V_1 = total volume removed from the start of the 24-hour simulated-use test to the end of the first recovery period, gal (L).

ρ_1 = density of the water at the water temperature measured at the point where the flow volume is measured, lb/gal (kg/ L).

C_{p1} = specific heat of the withdrawn water evaluated at $(\bar{T}_{del,1} + \bar{T}_{in,1})/2$, Btu/(lb·°F)
(kJ/(kg·°C))

$\bar{T}_{del,1}$ = average water outlet temperature measured during the draws from the start of the 24-hour simulated-use test to the end of the first recovery period, °F (°C).

$\bar{T}_{in,1}$ = average water inlet temperature measured during the draws from the start of the 24-hour simulated-use test to the end of the first recovery period, °F (°C).

V_{st} = as defined in section 6.3.1.

ρ_2 = density of stored hot water evaluated at $(\bar{T}_{max,1} + \bar{T}_0)/2$, lb/gal (kg/L).

C_{p2} = specific heat of stored hot water evaluated at $(\bar{T}_{max,1} + \bar{T}_0)/2$, Btu/(lb·°F)
(kJ/(kg·°C)).

$\bar{T}_{max,1}$ = maximum mean tank temperature recorded after cut-out following the first recovery of the 24-hour simulated use test, °F (°C).

\bar{T}_0 = maximum mean tank temperature recorded prior to the first draw of the 24-hour simulated-use test, °F (°C).

Q_r = the total energy used by the water heater between cut-out prior to the first draw and cut-out following the first recovery period, including auxiliary energy such as pilot lights, pumps, fans, etc., Btu (kJ). (Electrical auxiliary energy shall be converted to thermal energy using the following conversion: 1 kWh = 3412 Btu.)

6.3.2.2 For gas storage-type water heaters, if the first cut-out occurs during a draw, the recovery efficiency, η_r , is computed as:

$$\eta_r = \sum_{i=1}^{N_r} \frac{m_i * C_{pi} * (\bar{T}_{del,i} - \bar{T}_{in,i})}{Q_r} + \frac{V_{st} \rho_2 C_{p2} (\bar{T}_{max,1} - \bar{T}_0)}{Q_r}$$

Where:

N_r = number of draws from the start of the 24-hour simulated-use test to the end of the first recovery period. The first recovery period is defined by the time from the start of the 24-hour simulated-use test and continues during the temperature rise of the stored water until the first cut-out; if the cut-out occurs during a subsequent draw, the first recovery period includes the time until the draw of water from the tank stops. If, after the first cut-out occurs but during a subsequent draw, a subsequent cut-in occurs prior to the draw completion, the first recovery period includes the time until the subsequent cut-out occurs, prior to another draw.

m_i = mass of draw i .

C_{p_i} = average specific heat of draw i .

$\bar{T}_{del,i}$ = average water outlet temperature measured during i th draw of the first recovery period, °F (°C).

$\bar{T}_{in,i}$ = average water inlet temperature measured during the i th draw of the first recovery period, °F (°C).

V_{st} = as defined in section 6.3.1.

ρ_2 = density of stored hot water evaluated at $(\bar{T}_{max,1} + \bar{T}_o)/2$, lb/gal (kg/L).

C_{p2} = specific heat of stored hot water evaluated at $(\bar{T}_{max,1} + \bar{T}_o)/2$, Btu/(lb·°F) (kJ/(kg·°C)).

$\bar{T}_{max,1}$ = maximum mean tank temperature recorded after cut-out following the first recovery of the 24-hour simulated use test, °F (°C).

\bar{T}_o = maximum mean tank temperature recorded prior to the first draw of the 24-hour simulated-use test, °F (°C).

Q_r = energy consumption of water heater from the beginning of the test to the end of the first recovery period.

(3) *Representations.* BWC must make representations about the efficiency of the basic model listed in paragraph (1) of this Order for compliance, marketing, or other purposes only to the extent that the basic model has been tested in accordance with the provisions in this alternate test procedure and such representations fairly disclose the results of such testing.

(4) This waiver shall remain in effect according to the provisions of 10 CFR 430.27.

(5) This waiver is issued on the condition that the statements, representations, and documents provided by BWC are valid. If BWC makes any modifications to the controls or configurations of this basic model, the waiver will no longer be valid, and BWC will either be required to use the current Federal test method or submit a new application for a test procedure waiver. DOE may rescind or modify this waiver at any time if it determines the factual basis underlying the petition for waiver is incorrect, or the results from the alternate test procedure are unrepresentative of a basic model's true energy consumption characteristics. 10 CFR 430.27(k)(1). Likewise, BWC may request that DOE rescind or modify the waiver if BWC discovers an error in the information provided to DOE as part of its petition, determines that the waiver is no longer needed, or for other appropriate reasons. 10 CFR 430.27(k)(2).

(6) BWC remains obligated to fulfill any certification requirements set forth at 10 CFR part 429.

Signed in Washington, DC, on January 16, 2020.

Alexander N. Fitzsimmons

Acting Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

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